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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/686,784	10/10/2000	Miguel Philippe Paul Peeters	1875.5450000	4881

26111 7590 07/13/2004

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WASHINGTON, DC 20005

EXAMINER

WANG, TED M

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 07/13/2004

12

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/686,784

Applicant(s)

PEETERS, MIGUEL PHILIP  
PAUL

Examiner

Ted M Wang

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 5/3/2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

1. Claims 1-20 are pending in the application.

***Examiner's Statement***

2. Applicants' amendments and arguments, see paper # 11, filed on 5/3/2004, with respect to Claims 1 and 11 have been fully considered. The Applicants' arguments to Claims 1 and 11 define more precisely for the claimed apparatus and method and are persuasive. None of the previously cited reference teaches the amended Claim 1 and 11. Applicant adds claims 18-20. The Claims 1-20 have been reexamined. All drawing and disclosure objections are overcome by the amendment, see paper # 11, filed on 5/3/2004. The drawing and disclosure objections are withdrawn.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 1, 3-6, and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Timm et al. (US6,055,268) in view of Barton et al. (US6,449,246).

- In regard claim 1, Timm et al. discloses a multimode digital modem for demodulating a multi-tone, multi-band signal (column 17 lines 57-67, Fig. 6c)

using an inverse discrete Fourier transform or inverse fast Fourier transform to generate a signal having plurality of tones spaced in frequency in a plurality of frequency bands (Fig.6d element 640, and column 18 lines 1-2, column 47 line 29 – column 48 line 16), comprising a plurality of demodulators demodulates one of the plurality of frequency band of the multi-tone, multi-band signal (column 47 line 29 – column 48 line 16), and wherein each demodulator includes a discrete Fourier transform module that performs a discrete Fourier transform on the plurality of tones within one of the plurality of frequency band (Fig.6d element 666, and column 18 lines 1-20, and column 46 line 37 – column 48 line 16) except specifically teaching that a receiver comprises a plurality of demodulator. Barton et al. discloses a multicarrier personal access communication system with a receiver (Fig.10 element 400 and column 13 line 9 – column 14 line 60) comprising a plurality of demodulator (Fig.10 element 406 and column 13 line 9 – column 14 line 60) and in order to detect the over-the-air transmission from transmitter via plurality of processing paths for "diversity reception" and produce the "best" received signal.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Timm's receiver in view of Barton's disclosure in order to detect the over-the-air transmission from transmitter via plurality of processing paths for "diversity reception" and produce the "best" received signal.

- In regard claim 3, the limitation that each demodulator further includes an equalizer connected to the output of the discrete Fourier transform can further be taught by Timm in column 3 lines 19-23.
- In regard claim 4, the limitation that each demodulator further includes a filter for filtering the received signal prior to the discrete Fourier transform can further be taught by Timm in Fig.6d element 660.
- In regard claim 5, the limitation that a transceiver including a receiver according to claim 1 can further be taught by Timm in Fig. 14a, 14c, and 14d.
- In regard claim 6, the limitation that each demodulator includes an echo canceller for removing an echo associated with a signal in a transmitter of the transceiver from the received signal can further be taught by Timm in column 2 lines 64-66.
- In regard claim 10, the limitation that the multi-band signal is generated by filtering the output of the modulator can further be taught by Timm in Fig.4a element 44.
- In regard claim 11, which is a method claim related to claim 1. All limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 12, which is a method claim related to claim 3. All limitation is contained in claims 3. The explanation of all the limitation is already addressed in the above paragraph.

- In regard claim 13, which is a method claim related to claim 4. All limitation is contained in claims 4. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 14, which is a method claim related to claim 5. All limitation is contained in claims 5. The explanation of all the limitation is already addressed in the above paragraph.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Timm et al. (US6,055,268) in view of Barton et al. (US6,449,246) and further in view of Lee et al. (US5,818,296).

- In regard claim 2, Timm et al. and Barton et al. disclose all the limitation as described in claim 1 except specifically teaching that the process speed of each demodulator is determined by the respective frequency.

Lee et al. cited by the instant applicant discloses a demodulator that the process speed of each demodulator is determined by the respective frequency (column 3 line 57 – column 4 line 13) in order to speed up the subsequent demodulation processes.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Timm's and Barton's receiver further in view of Lee's disclosure in order to speed up the subsequent demodulation processes.

6. Claims 7, 8, 15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Timm et al. (US6,055,268) in view of Barton et al. (US6,449,246) and further in view of Ho et al. (US5,317,596).

- In regard claim 7, Timm et al. and Barton et al. disclose all the limitation as described in claim 1 except specifically teaching that echo canceller is connected to remove the echo at the input to the discrete Fourier transform.

Ho et al. discloses an apparatus for echo cancellation with discrete multitone modulation that echo canceller is connected to remove the echo at the input to the discrete Fourier transform (Fig.3 elements 100 and 56 and column 5 line 26 – column 6 line 25) in order to provide an improved echo canceller that accurately estimates and eliminates unwanted echo present in full-duplex data communication channels.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Timm's and Barton's receiver further in view of Ho's disclosure in order to provide an improved echo canceller that accurately estimates and eliminates unwanted echo present in full-duplex data communication channels.

- In regard claim 8, the limitation that each echo canceller comprises an adaptive filter can further be taught in column 6 line 50 – column 7 line 4.
- In regard claim 15, which is a method claim related to claim 6. All limitation is contained in claims 6. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 17, which is a method claim related to claim 10. All limitation is contained in claims 10. The explanation of all the limitation is already addressed in the above paragraph.

7. Claims 9 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Timm et al. (US6,055,268) in view of Barton et al. (US6,449,246) and further in view of Agee (US6,128,276).

- In regard claim 9 and 16, Timm et al. and Barton et al. disclose all the limitation as described in claim 1 except specifically teaching that the multi-band signal is generated by nulling selected tones in the modulator.

Agee discloses a stacked-carrier discrete multiple tone communication technology and combinations with code nulling, interference cancellation, retrodirective communication and adaptive antenna arrays that the multi-band signal is generated by nulling selected tones in the modulator (Fig.4a element 86 and Fig.4b element 98, and column 11 lines 33-65 in order to maximize the signal-to-interference-and-noise ratio of the despread message sequence.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Timm's and Barton's receiver further in view of Ho's disclosure in order to maximize the signal-to-interference-and-noise ratio of the despread message sequence.

8. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Timm et al. (US6,055,268) in view of Barton et al. (US6,449,246) and further in view of Feher (US6,470,055).

- In regard claim 18, Timm et al. and Barton et al. disclose all the limitation as described in claim 1 and 3 except specifically teaching that the receiver comprises a splitter that divides the received signal into a plurality of data



signals, each data signal having a plurality of tones in one of the plurality of frequency bands, wherein the splitter communicates each of the plurality of data signals to one of the plurality of demodulators that demodulates the frequency band of the data signal.

Feher discloses a spectral efficient transmitters-receivers (transceivers) comprising a splitter (Fig.36 element 36.2 and column 38 lines 43-52) that divides the received signal into a plurality of data signals, each data signal having a plurality of tones in one of the plurality of frequency bands, wherein the splitter communicates each of the plurality of data signals to one of the plurality of demodulators that demodulates the frequency band of the data signal (Fig.36 elements 36.6-36.8 and column 38 lines 43-52) in order to enhance performance and increase capacity of CDMA, TDMA, GSM, OFDM, CMA, FDM and other wireless and wired communications, broadcasting, and telemetry systems. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Timm's and Barton's receiver further in view of Feher's disclosure in order to enhance performance and increase capacity of CDMA, TDMA, GSM, OFDM, CMA, FDM and other wireless and wired communications, broadcasting, and telemetry systems.

9. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Timm et al. (US6,055,268) in view of Barton et al. (US6,449,246) and further in view of Feher (US6,470,055) and further in view of Kahre (US5,680,388).

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- In regard claim 19, Timm et al. and Barton et al. and Feher disclose all the limitation as described in claim 18 except specifically teaching that the discrete Fourier transform module performs a discrete Fourier transform at sampling frequency ( $F_s, k$ ) wherein the sampling frequency ( $F_s, k$ ) is associated with the frequency band of the demodulator.

Kahre discloses a method and arrangement for dynamic allocation of multiple carrier-wave channels for multiple access by frequency division of multiplexing that the discrete Fourier transform module performs a discrete Fourier transform (Fig.3 element S) at sampling frequency ( $F_s, k$ ) wherein the sampling frequency ( $F_s, k$ ) is associated with the frequency band of the demodulator (Fig.3 element U, and column 4 lines 23-40) in order to provide more accurately mobiles synchronization and reduce the oversampling requirement.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Timm's and Barton's and Feher's receiver in view of Kahre's disclosure in order to provide more accurately mobiles synchronization and reduce the oversampling requirement.

- In regard claim 20, the limitation that the sampling frequency ( $F_s, k$ ) is at least double the maximum frequency of the frequency band of the demodulator can further be taught by Kahre in column 4 lines 23-40.

***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136 (a).

11. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M Wang whose telephone number is (703) 305-0373. The examiner can normally be reached on 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Chin can be reached on (703) 305-4714. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.


Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

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Ted M Wang  
Examiner  
Art Unit 2634

Ted M. Wang



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